Market Segment: Utilities

POWER PROFILE

Customer: AltaLink

Location:
Calgary, Alberta, Canada

Customer Business Issue:
Continuous operation of temporary power plant

Solution:
XQ2000 rental generator sets (6), Cat® Connect Remote Asset Monitoring

Cat® Dealer:
Finning Canada

An important stage of AltaLink's project involved replacing the structures and conductor in the mountainous terrain, which did not allow for the construction of a temporary line to keep the lights on for the loads west of Banff.

POWER NEED

As one of Canada's largest transmission companies, AltaLink is responsible for the maintenance and operation of approximately 7,500 miles of transmission lines and 280 substations in the province of Alberta—which make up the bulk of Alberta's high-voltage electricity transmission infrastructure.

In one of its bigger projects to date, last summer AltaLink replaced an aging power transmission line in Banff National Park—Canada's first national park and the flagship of the nation's park system. Banff is part of the Canadian Rocky Mountains and is a popular tourist destination.

Lake Louise and everything west of the town of Banff is fed by only one transmission line that runs along the Bow River. The 37-mile line serves all of the residents and business living west of Banff, including recreation properties along the Bow Valley Parkway, the village of Lake Louise, as well as both the Sunshine and Lake Louise ski areas.

The line was built in the 1960s and many of the structures had reached the end of their useful life—which impacts power reliability—so it was necessary to replace it, said Brent Sandhu, senior project manager with AltaLink, which is headquartered in Calgary.

"Dangerous trees along the right-of-way contacting the line in storm events are the biggest cause of outages in the area," he said, noting there have been numerous power outages caused by interference on the line in the past 12 to 14 years.

Commencing in early spring of 2019, the project involved the replacement of the structures and wire on the 37-mile transmission line with new, taller structures and the removal of trees along the right-of-way that could potentially fall on the line.

During the summer of 2019, the project entered an important stage involving the replacement of the structures and conductor in the mountainous terrain, which did not allow for the construction of a temporary line to keep the lights on for the loads west of Banff while the crews rebuilt the line.

SOLUTION

The area required an alternate source of power from July 1 until September 30. AltaLink called on Cat dealer Finning Canada to supply 10 MW of power at a temporary plant set up just east of the Trans-Canada highway outside of Lake Louise. The installation included six Cat XQ2000 diesel rental power generator sets, which ran 24/7 and were connected to a temporary electrical switch station that fed power to a nearby substation.

The turnkey solution provided by Finning included the engineering and design, as well as operating and maintaining the plant for the duration of the project. To ensure reliability, the generator sets were monitored remotely at Finning's Edmonton headquarters by a team of condition monitoring analysts using Cat Connect Remote Asset Monitoring (RAM) technology. In order to minimize the sound emanating from the site, shipping containers were positioned around the west-facing perimeter.

"AltaLink wanted us to supply power and not have to worry about it so they could concentrate on replacing the power line," said Mike Kuzminski, an industry manager in Finning's rental power division. "It was our responsibility to do the front-end engineering to ensure that we could manage all of the electrical loads.

"We needed to provide a power plant that would run 100 percent of the time for a three-month period," Kuzminksi said. "So, with the power generation equipment that we provided through Caterpillar, our on-site refueling system, and with operators on-site 24/7, we were really able to bring a complete turnkey solution together to provide AltaLink exactly what they wanted."

To ensure 100 percent reliability, Finning guaranteed uptime of the plant through its use of RAM which offers real-time collection and remote monitoring of site performance data in distributed energy and rental applications.

"On a project such as this, reliability and uptime are important, and with Cat remote monitoring you can see fault codes and know the instant that something has happened," says Amber DeJong, a Cat rental power rep for the western

POWER PROFILE

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region of North America. "You can monitor how much load is on each generator set, as well as check fuel levels."

Providing data, visualization, reporting, and alerts from anywhere in the world through an easy-to-use web interface, this technology helps equipment operators and Cat dealers track and manage the operation of the system. With RAM, dealers and power customers can:

- Flag potential problems
- Perform remote troubleshooting
- Offer long-term archives of site performance history
- Use data to optimize system and run at peak performance

"The Cat RAM remote asset monitoring dashboard is a user-friendly way to look at the current operating status of generator sets," DeJong says. "You can flip through the screens, look at the different generators, unit by unit, or as a group together. You can monitor the entire dealer fleet, or just monitor a specific site or a specific customer or group of customers."

RESULTS

Finning Canada's power systems division has utilized condition monitoring since 2016. It started with two condition monitoring analysts and has evolved into a department with six analysts who continuously monitor the performance of customers' generator sets across western Canada from a dedicated office in Edmonton.

Finning is currently monitoring the generator sets of 63 customers who are connected through the Cat RAM technology, says Olivier Viel, a condition monitoring manager for Finning.

With six XQ2000 generators powering the 10 MW temporary power plant near Lake Louise, as well as transformers and two 75,000 liter diesel fuel tanks, having an additional layer of backup was important to ensure uninterrupted power to the area.

"We had not only our operators on-site making sure all the daily maintenance and checks were done properly, but we also have condition monitoring viewing where our people are continuously looking at the units real-time back in Edmonton," Kuzminski says.

"Our analysts in Edmonton can provide real-time feedback to our technicians in the event that they see something cropping up that we can recognize in advance that could lead to a shutdown," Kuzminski says. "So, it plays a significant role in our reliability."

If any faults pop up, the condition monitoring analysts will see it right away and notify the customer or a Finning technician in the field.

"And in case one of our technicians might be missing something directly while he's at site, there will be a phone call placed to those technicians or to myself and we will further investigate the issues and correct them as needed," says Nathan Biederstadt, a field service supervisor for Finning Power Systems in Calgary.

"Having our fleet connected to remote asset monitoring really gives us a second set of eyes to view the equipment and provide real-time status back to our team in the field," Kuzminski adds. "This allows us to schedule preventative maintenance in advance knowing what the condition of the units is."

According to Brad Roshau, a condition monitoring analyst in Finning's Edmonton office, the greatest benefit to the customer is remote fleet monitoring which provides live troubleshooting on issues that may arise on a generator set.

"A lot of customers are not actively monitoring their equipment for issues, so we remotely monitor it for them," Roshau says. "We're able to address issues before they turn into real problems and cause an unexpected shutdown. We can get in touch with our customer directly and protect their equipment by letting them know what's going on and get one of our technicians out to service the engine right away."

Ultimately, Cat Connect Remote Asset Monitoring is a form of insurance for a customer who is either renting power or has a permanent installation.

"They can concentrate on doing what they do in their business," Roshua says. "And we are here to make sure their power system or rental unit remains in peak operating condition."

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